

IBM SPSS: Memphis Police Department

A detailed ROI case study

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Customer:

Memphis Police Department

Industry:

Government

Deployment country:

United States

Solution:

Business Analytics and Optimization (BAO), Business Continuity, Business Analytics and Optimization (BAO), ROI Study

Overview

Memphis Police Department used IBM SPSS predictive analytics software to improve its overall operations, enabling it to considerably reduce crime without a proportional increase in staff while expanding its territory.

Business need:

- A way to respond faster to unfolding crime. With the time-consuming process of searching through an array of spreadsheets and paper files, officers were spending several hours looking for information vital to solving or preventing crimes instead of responding faster. - Innovative, new practices to predict, track, and respond promptly to crimes committed. - A way to cost-efficiently upgrade its resources, utilize funds in the most effective way, and increase the overall effectiveness of the department.

Solution:

In 2005, Memphis Police Department partnered with the Department of Criminology and Criminal Justice at The University of Memphis to create a predictive analytics system called Blue CRUSH (Criminal Reduction Utilizing Statistical History). It selected IBM SPSS predictive analytics software to support Blue CRUSH .

Results:

The analytical and statistical capabilities available to the MPD through the use of IBM SPSS has allowed it to identify, target, and better respond to crime.

Benefits:

- Increased overall visibility into crime activity. - Improved communication. - Increased overall productivity.

Case Study

THE BOTTOM LINE

Memphis Police Department used IBM SPSS predictive analytics software to improve its overall operations, enabling it to considerably reduce crime without a proportional increase in staff while expanding its territory.

ROI: 863%

Payback: 2.7 months

Average annual benefit: \$7,205,501

THE COMPANY

The Memphis Police Department (MPD), located in Memphis, TN, was first established in 1827 when it appointed its first town constable. Today, with more than 3500 officers, MPD has been recognized for its efforts to improve the quality and standard of living for its citizens through the use of technology and training facilities.

THE CHALLENGE

In 2004 and 2005, the MPD was experiencing a sharp increase in crime. The FBI's 2005 report on crime within the United States showed that violent crimes on a national level increased 2.3 percent from 2004 to 2005, and in Memphis, that increase was 2.5 percent. MPD recognized it needed to move beyond traditional policing approaches. It needed:

- A way to respond faster to unfolding crime. With the time-consuming process of searching through an array of spreadsheets and paper files, officers were spending several hours looking for information vital to solving or preventing crimes instead of responding faster.
- Innovative, new practices to predict, track, and respond promptly to crimes committed.
- A way to cost-efficiently upgrade its resources, utilize funds in the most effective way, and increase the overall effectiveness of the department.

THE STRATEGY

In 2005, Memphis Police Department partnered with the Department of Criminology and Criminal Justice at The University of Memphis to create a predictive analytics system called Blue CRUSH (Criminal Reduction Utilizing Statistical History). It selected IBM SPSS predictive analytics software to support Blue CRUSH for two main reasons:

- MPD had a long-standing relationship with the university and Professor W. Richard Janikowski, director of the university's Center for Community Criminology and Research. The university had been using IBM SPSS for many years to evaluate crime-related and other data, and MPD could take advantage of the university's experience and expertise with the software.
- IBM SPSS could easily integrate with other solutions, allowing MPD to create a customized application that best met its overall needs. Blue CRUSH was able to integrate IBM SPSS and a geographic information systems tool to both analyze and visualize data in the form of charts, geographical maps, and reports.

After extensive training of civilian personnel and field officers by MPD and the University of Memphis, Blue CRUSH was deployed in August 2005 within select precincts before going citywide.

KEY BENEFIT AREAS

The analytical and statistical capabilities available to the MPD through the use of IBM SPSS has allowed it to identify, target, and better respond to crime. Key benefits of the project include:

- Increased overall visibility into crime activity. MPD has the capability to evaluate "incident patterns" throughout the city based on previous and current crime patterns that are analyzed and updated continually. This has allowed the department to identify crime "hot spots," the type of offenses committed in these zones along with the time of day or day of the week they occurred, and offender characteristics.
- Improved communication. With the use of IBM SPSS, MPD is able to share information with government agencies or other law enforcement agencies to aid in the proper prosecution of criminals. It also enables MPD to communicate with the media and local communities about offenders and specific "hot spot" areas to better assist in the prevention and overall decline of criminal activity through neighborhood watch initiatives and other strategies.
- Increased overall productivity. With information readily available, officers no longer need to spend valuable time looking for reports or information pertaining to a crime. As a result, MPD has seen a reduction in violent crime, property crime, and part 1 crimes (which include violent and property crimes) by an average of 15.8 percent without a corresponding increase in officers — while expanding its overall geographical coverage.
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BENEFITS

Direct: 0%

Indirect: 100%

TOTAL: \$22,236,123

KEY COST AREAS

Key cost areas for the deployment included software, personnel, hardware, and training. The initial costs to implement the software were minimal for Memphis Police Department because it relied on expertise from the University of Memphis's Department of Criminology and Criminal Justice. MPD does pay for ongoing software costs in the form of yearly license contract renewal and annual maintenance. Hardware costs consisted of servers and PCs needed to utilize the application. The greatest cost areas include personnel and the initial and ongoing training of civilians and officers.

BEST PRACTICES

Key to the success of the MPD's analytics strategy has been the expertise of the University of Memphis and the University's Center for Community Criminology and Research's ability to provide training and support for the project. A collaborative relationship and support from the director of the center has helped the MPD to improve its crime fighting efforts on an ongoing basis by leveraging both existing historical data and analytics. The MPD gives officers who are interested and technically minded the opportunity to take training courses to learn the system each year; officers are tested and must maintain high scores to continue working in the program. As such, becoming a predictive analytics expert is an opportunity for seasoned officers who are technologically oriented to expand their horizons.

CALCULATING THE ROI

Nucleus calculated the costs of software, hardware, consulting, personnel, training, and other investments over a 3-year period to quantify Memphis Police Department's investment in SPSS predictive analytics software. Because the police department has an enterprise license for its GIS software, part of the cost was attributed to the project based on the estimated share of users.

COSTS

Software: 28%
Personnel: 55%
Training: 13%
Hardware: 4%
TOTAL: \$1,185,746

Nucleus quantified the benefit of reduced crime by calculating the percentage change in part one crimes year on year since the launch of Blue CRUSH and the percentage change in overall payroll to determine the number of additional officers that would have been needed to reduce an equivalent amount of crimes. This is a conservative estimate, as the MPD has also taken responsibility for more geographical territory without additional staff since the launch of Blue CRUSH.

SUMMARY

Project: **IBM Business Analytics**
Annual return on investment (ROI) **863%**
Payback period: **2.3 Months**

Average annual benefit **\$7,205,501**
Average annual total cost of ownership **\$395,249**

Annual ROI - direct and indirect benefits 863%

Annual ROI - direct benefits only -16%
Net present value (NPV): (\$7,159,262)

Payback: 2.3 months

Average annual cost of ownership: \$395,249
3-year IRR: 481%